course, cure speed can be enhanced by use of a known primer such as tetramethyl thiourea of the condensation product of butyraldehyde and aniline.

EXAMPLE 10

One of the merits of the adhesives formed from the prepolymers of this invention is their ability to retain useful levels of strength after lengthy exposure to high temperatures. This is illustrated in Table III. The strength test used was the compressive shear test already described. The specimens were aged at 450° F. for the number of weeks shown, then divided into two groups, which were tested at room temperature and 400° F., respectively. The resin used was prepolymer D, above.

TABLE III

Heat Aging Period, Weeks	Compressive Shear Strength, psi	
	room temperature	400° F.
0	2750	480
1.0	3060	1100
1.5	2360	750
2.0	1470	350
2.5	1400	260
3.0	260	240
4.0	350	200
5.0	100	80
6.0	30	50

EXAMPLE 11

Another distinct advantage of the present prepolymers is their ability to cure through large gaps, e.g., 40 mils or more. Table III presents typical tensile shear and impact strengths for prepolymer D, above, at different gaps. Except for the instance noted in the Table, cures were achieved at room temperature on sand-blasted steel surfaces primed with a tetramethyl thiourea activator known to the art. Cure time up to 20 mils was 24 hours; at 41 mils and above, it was 72 hours.

TABLE IV

Gap, mils	Tensile Shear Strength, psi	Impact, Strength ft.lbs./sq.in.
0	2340	12.0
20	1800	9.2
41	1430	9.9
55	960	5.5
85	360	
85*	1370	

*with additional heat cure: 1 hour at 200° F.

EXAMPLE 12

A curable formulation was prepared using prepolymer D (Table I) according to the procedure of Example 8, except that 3–5 percent (based on total formulation weight) benzophenone was substituted for the CHP. A 2–5 mil thick film of the formulation was spread on a piece of glass and exposed to ultraviolet radiation. The UV source was a 400-watt mercury vapor bulb housed in a "Porta-Cure 400" lamp, both bulb and lamp manufactured by American Ultraviolet Co. The UV source was adjusted to provide 600 microwatts of radiation intensity at the film. After 15–19 minutes of exposure, the formulation had cured to a hard, dry film.

The same formulation was used to assemble a lap shear test specimen, except that glass strips were used instead of steel. The specimen was exposed to UV radiation of 6,000 microwatts at the bond line. In about 40 seconds, the glass strips had become fixtured (could not be moved by hand relative to each other).

EXAMPLE 13

An adhesive formulation was prepared using prepolymer D (Table I) according to the procedure of Exhibit 8, except that 3–5 percent (based on total formulation weight) of benzoyl peroxide was substituted for the CHP. A 2–5 mil thick film of the adhesive was spread on a piece of steel and placed in a 200° F. oven for 1½ hours, then cooled to room temperature. The formulation cured to a dry, durable film.

A tensile lap shear test was performed with this formulation according to the ASTM procedure mentioned in Example 9. The same heat cure as above was applied, resulting in a bond strength of 3750 psi.

What is claimed is:

1. An adhesive and sealant composition having improved thermal and impact properties and curable through gaps of more than 40 mils, comprising:.

I. a polymerizable product corresponding in structure to a reaction product of:

(a) a polybutadiene polyol of polyamine comprising about 5 to about 150 butadiene units and having at least about 70 percent of the butadiene units in the 1,4-configuration and selected from the group consisting of polybutadiene, butadiene-acrylonitrile copolymers, and butadiene-styrene copolymers, and,

(b) a molar excess of a reaction product of: a molar excess of an aromatic or cycloaliphatic polyisocyanate with a compound selected from the group consisting of an aromatic or cycloaliphatic polyol,

the product of (a) and (b) subsequently being reacted with a molar excess of a hydroxyalkyl acrylate, a hydroxyalkyl methacrylate, an aminoalkyl acrylate, or an aminoalkyl methacrylate; and

II. a free radical initiator.

2. A composition of claim **1** wherein the polybutadiene polyol is a poly(butadiene-acrylonitrile)diol.

3. A composition of claim **1** wherein the polyisocyanate is toluene diisocyanate.

4. A composition of claim **1** wherein the polyisocyanate is 4,4'-diisocyanate diphenylmethane.

5. A composition of claim **1** wherein reaction product (b) is an NCO-terminated product of hydrogenated bisphenol-A and toluene diisocyanate.

6. A composition of claim **1** wherein the hydroxyalkyl methacrylate is hydroxyethyl methacrylate.

7. A composition of claim **1** wherein the hydroxyalkyl methacrylate is hydroxypropyl methacrylate.

8. A composition of claim **1** which additionally contains an organic solvent.

9. A composition of claim **8** wherein the solvent is a coreactive solvent.

10. A composition of claim **1** wherein the initiator is a peroxy initiator.

11. A composition of claim **1** wherein the initiator is an ultraviolet-activated initiator.

12. An anaerobic adhesive and sealant composition having improved thermal and impact properties and curable through gaps of more than 40 mils, comprising:

I. a polymerizable product corresponding in structure to a reaction product of:

(a) a polybutadiene polyol or polyamine comprising about 5 to about 150 butadiene units and having at least about 70 percent of the butadiene